103

S. HRG. 103–758

WEATHER SATELLITE CONVERGENCE

Y 4.C 73/7:S.HRG.103-758

Weather Satellite Convergence, S.Hr...

HEARING

BEFORE THE

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION UNITED STATES SENATE

ONE HUNDRED THIRD CONGRESS

SECOND SESSION

JUNE 14, 1994

Printed for the use of the Committee on Commerce, Science, and Transportation

GOVERNMENT DOCUMENTS DEPOSITORY
DEC 13 1994
BOSTON PUBLIC LIBRARY
GOVERNMENT DOCUMENTS DEPOSITORY

U.S. GOVERNMENT PRINTING OFFICE
80–347 CC WASHINGTON : 1994

For sale by the U.S. Government Printing Office
Superintendent of Documents, Congressional Sales Office, Washington, DC 20402
ISBN 0-16-045966-4

103

S. HRG. 103–758

WEATHER SATELLITE CONVERGENCE

Y 4.C 73/7:S.HRG.103-758

Weather Satellite Convergence, S.Hr...

HEARING

BEFORE THE

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION UNITED STATES SENATE

ONE HUNDRED THIRD CONGRESS

SECOND SESSION

JUNE 14, 1994

Printed for the use of the Committee on Commerce, Science, and Transportation

GOVERNMENT DEPOSITORY
DEC 13 1994
BOSTON PUBLIC LIBRARY
GOVERNMENT DOCUMENTS DEPARTMENT

U.S. GOVERNMENT PRINTING OFFICE
80–347 CC WASHINGTON : 1994

For sale by the U.S. Government Printing Office
Superintendent of Documents, Congressional Sales Office, Washington, DC 20402
ISBN 0-16-045966-4

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

ERNEST F. HOLLINGS, South Carolina, *Chairman*

DANIEL K. INOUYE, Hawaii
WENDELL H. FORD, Kentucky
J. JAMES EXON, Nebraska
JOHN D. ROCKEFELLER IV, West Virginia
JOHN F. KERRY, Massachusetts
JOHN B. BREAUX, Louisiana
RICHARD H. BRYAN, Nevada
CHARLES S. ROBB, Virginia
BYRON L. DORGAN, North Dakota
HARLAN MATHEWS, Tennessee

JOHN C. DANFORTH, Missouri
BOB PACKWOOD, Oregon
LARRY PRESSLER, South Dakota
TED STEVENS, Alaska
JOHN McCAIN, Arizona
CONRAD BURNS, Montana
SLADE GORTON, Washington
TRENT LOTT, Mississippi
KAY BAILEY HUTCHISON, Texas

KEVIN G. CURTIN, *Chief Counsel and Staff Director*
JONATHAN CHAMBERS, *Republican Staff Director*

CONTENTS

	Page
Opening statement of Senator Exon	16
Opening statement of Senator Hollings	1

LIST OF WITNESSES

Baker, the Honorable D. James, Under Secretary of Commerce for Oceans and Atmosphere, National Oceanic and Atmospheric Administration	6
Prepared statement	8
Schneiter, Dr. George E., Director, Strategic and Space Systems, Department of Defense	11
Prepared statement	12
Watson, the Honorable Robert T., Associate Director for Environment, Office of Science and Technology Policy, the White House	1
Prepared statement	4

WEATHER SATELLITE CONVERGENCE

TUESDAY, JUNE 14, 1994

U.S. SENATE,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
Washington, DC.

The committee met, pursuant to notice, at 10:20 a.m. in room SR–253, Russell Senate Office Building, Hon. Ernest F. Hollings (chairman of the committee) presiding.

Staff members assigned to this hearing: Penelope D. Dalton, senior professional staff member, and Elizabeth Inadomi, staff counsel; and Louis C. Whitsett, minority staff counsel.

OPENING STATEMENT OF SENATOR HOLLINGS

The CHAIRMAN. The committee will come to order.

We have a very interesting presentation this morning. I want to see how the administration is going to save money. I have heard Dr. Baker on this subject some time ago and so I want to welcome on behalf of the committee the Honorable James Baker, the Under Secretary of Commerce for Oceans and Atmosphere; the Honorable Robert T. Watson, the Associate Director for the Environment at the Office of Science and Technology; Dr. George Schneiter, the Director of Strategic Space Systems, the Department of Defense; and Mr. Townsend, I think, is in association with Dr. Baker here. No, you are back over at NASA now.

Mr. TOWNSEND. That is right.

The CHAIRMAN. We keep swapping them around. You do a good job. We are glad to have you back.

Let us start. Do you have a preference? Otherwise, Dr. Watson, go right ahead.

STATEMENT OF THE HONORABLE ROBERT T. WATSON, ASSOCIATE DIRECTOR FOR ENVIRONMENT, OFFICE OF SCIENCE AND TECHNOLOGY POLICY, THE WHITE HOUSE

Dr. WATSON. Thanks, Mr. Chairman. I appreciate this opportunity to appear before you to comment on the administration's decision to converge this Nation's military and civilian Polar Orbiting Environmental Satellite Program into a single national system. I will give you an overview of this issue, and then Dr. Baker and Dr. Schneiter will give you more details from the perspective of both NOAA and from DOD.

For the past 3 decades the United States has operated separate civilian and military satellite systems which collect, process, and distribute meteorological, oceanographic, hydrological, and space environmental data. The Department of Commerce through NOAA

is responsible for the POES system, the Polar-Orbiting Operational Environmental Satellite Program, and the key aspects of this system include collecting atmospheric data for weather forecasting, global climate research, and emergency search and rescue. The Department of Defense is responsible for the DMSP satellite system, which provides capability for the collection and distribution of global visible and infrared cloud data and other specialized meteorological, oceanographic data to support military operations.

While NASA has no operational satellite systems, it has initiated a very important research program called Mission to Planet Earth. One key portion of that effort is called the Earth Observing System. The EOS is a series of five different satellite systems in a variety of orbits measuring various parameters critical to understanding global climate change in the broad sense of the word, the atmosphere of the ocean and the land.

One of these EOS satellite systems is called the PM Satellite System. That means to say the satellite passes over the equator in the afternoon. Several of the climate monitoring instruments on the EMS PM satellite are large and more complex versions of the operational meteorological instruments currently flying on the NOAA weather satellites.

The President's decision requires the Department of Commerce and the Department of Defense to converge their two separate operational systems into one single converged system. This will result in a system that will have the data needed to meet both the civil and national security requirements and fulfill all international obligations. NASA's EOS satellite system development will provide new remote sensing and satellite technologies that could provide improved operational capability for the converged system.

The goal of the converged program is to reduce cost while at the same time satisfying U.S. operational civil and national security requirements. The decision implements a recommendation contained in the Vice President's National Performance Review published last September. The savings to the American taxpayer are estimated to be up to $300 million in budget authority over the next 5 years, and up to $250 million in outlays. We believe the budget savings will be even greater past the year 2000.

The converged program will be conducted in accordance with several principles: One, the operational environmental data from the satellites are important to the achievement of U.S. economic, national security, scientific, and foreign policy goals; two, there will be assured access to operational environmental data to meet civilian and national security requirements and international obligations; three, the United States will ensure its ability to selectively deny critical environmental data to an adversary during crisis or war yet ensure the use of such data by U.S. and allied military forces—however, such data will be made available to all other users when it no longer has military utility; fourth, the implementing actions will be accommodated within the overall resource policy guidance of the President.

The Presidential decision directs the Department of Commerce, the Department of Defense, and NASA to create an integrated program office for the Converged Polar Orbiting Operational Satellite System by October of this year. We believe this is a very important

step to have the single converged program office. This office will be responsible for the management, acquisition, and operation of the converged system. It will be under the direction of a single system program director and three associate directors, each of which will provide a particular guide, a particular functional area.

The SPD—that is, the system program director—will be nominated by NOAA and approved by the Triagency Executive Committee. The associate directors will be nominated by their appropriate participating agency and approved by the SPD. The Under Secretary level Executive Committee—the EXCOM—will act as a board of directors to the program which will ensure to coordinate the program plans, the budgets, the policies, and will assure agency funded commitments are equitable and sustainable.

The three agencies are in the process of identifying, validating, and documenting requirements for the converged system. Those requirements will define the system baseline used to develop agency budgets. The reason we do not have hard budget numbers today is we first have to develop the requirements for the system and second we have to define the operational system in more detail. That is why our budget numbers today are somewhat soft.

The Department of Commerce through NOAA will have lead-agency responsibility to the executive committee for the converged system; NOAA will have lead-agency responsibility to support the IPO for its satellite operations; they will also be the lead-agency for interfacing with national and international civil user communities consistent with national security and foreign policy requirements, and these will be detailed by the next two speakers. The Department of Defense will have lead-agency responsibility to support the IPO in major systems acquisitions, and NASA will have the lead-agency responsibility to support the IPO in facilitating the development and insertion of new cost-effective technologies to meet operational requirements.

The United States will seek to implement the converged system in a manner that encourages cooperation with foreign governments and international organizations consistent with U.S. requirements and national interests. This cooperation will be conducted in support of these requirements in coordination with the Department of State and other interested agencies.

The agencies are intent on converging the two U.S. operational meteorological satellite programs. The first major step toward this end is establishing the Integrated Program Office. The three agencies have already established a triagency ad hoc convergence transition team to develop the plan to activate the IPO. As a first order of business, the agencies will select the individuals to fill the key positions. The TACTT will then at a minimum conduct those planning activities necessary to develop memorandums of agreements between the agencies, locate and occupy facilities for the IPO, and further define detailed management and programmatic procedures.

This approach reflects a change in previous interagency working groups because specialized programmatic and technical expertise of each agency will focus upon working together to meet the program sets of combined requirements and less on the previous narrow specialized perspectives of each parent agency.

The Triagency Steering Committee has captured the spirit of reinventing government, as this group did not limit itself to reusing previous methods and approaches; rather, the triagency convergence study group identified and analyzed, from previous lessons, how to solve the problems in innovative ways that would offer solutions that would be likely to be cost-effective and endure the test of time.

We believe that we can have success with this program, we believe the Integrated Program Office will be successful, we believe we will save money, and we believe we can work out successfully ways to work with our international partners.

With that, Mr. Chairman, I appreciate the opportunity to testify in front of you today.

[The prepared statement of Dr. Watson follows:]

PREPARED STATEMENT OF DR. ROBERT T. WATSON

I appreciate this opportunity to appear before you to comment on the Administration's decision to converge this nation1s military and civilian polar-orbiting environmental satellite program into a single national system.

For the past three decades, the United States has operated separate civil and military polar-orbiting environmental satellite systems which collect, process and distribute remotely-sensed meteorological, oceanographic, hydrologicaI, and space environmental data. The Department of Commerce (DoC) National Oceanic and Atmospheric Administration (NOAA) is responsible for the Polar-Orbiting Operational Environmental Satellite (POES) program. Key aspects of the POES mission include collecting atmospheric data for weather forecasting, global climate research and emergency search and rescue purposes. The Department of Defense (DoD) is responsible for the Defense Meteorological Satellite Program (DMSP). The mission of DMSP is to provide a survivable capability for collection and distribution of global visible and infrared cloud data and other specialized meteorological, oceanographic and solar geophysical data to support military operations.

While the National Aeronautics and Space Administration (NASA) has no operational satellite systems it has initiated a research program called Mission to Planet Earth (MTPE). A key portion of that effort is the Earth Observing System (EOS); a series of five different satellite systems in a variety of orbits measuring various parameters critical to understanding global climate change. One of these satellite series is called the EOS-PM (PM indicating that the satellite passes over the equator in the afternoon). Some of the climate monitoring instruments on EOS-PM are large and more complex research versions of the operational meteorological instruments currently flying on the NOAA weather satellites.

The President's decision requires the Departments of Commerce and Defense to converge Commerce's POES program and Defense's DMSP. This will result in a single national polar-orbiting operational environmental satellite system which will provide data needed to meet both U.S. civil and national security requirements, and to fulfill international obligations. NASA's EOS-PM development efforts will provide new remote sensing and spacecraft technologies that could improve the operational capabilities of the converged system.

The goal of the converged program is to reduce the cost of acquiring and operating polar-orbiting operational environmental satellites, while continuing to satisfy U.S. operational civil and national security requirements. The decision implements a recommendation contained in the Vice President's National Performance Review (NPR), published last September. The savings to the American taxpayer are estimated to be up to $300 million in budget authority and up to $251 million in outlays from projected levels between fiscal years 1994 and 1999, based on the FY 1994 budget.

The converged program will be conducted in accordance with the following principles:

- the operational environmental data from polar-orbiting satellites are important to the achievements of U.S. economic, national security, scientific, and foreign policy goals;
- assured access to operational environmental data will be provided to meet civil and national security requirements and international obligations;
- the United States will ensure its ability to selectively deny critical environmental data to an adversary during crisis or war yet ensure the use of such data

by U.S. and Allied military forces. Such data will be made available to other users when it no longer has military utility; and

- the implementing actions will be accommodated within the overall resource policy guidance of the President.

The National Science and Technology Council (NSTC) Presidential Decision Directive directs the Department of Commerce, the Department of Defense, and NASA to create an Integrated Program Office (IPO) for the converged polar-orbiting operational satellite system by October 1, 1994. The IPO will be responsible for the management, acquisition, and operation of the converged system. The IPO will be under the direction of a single System Program Director (SPD), and three Associate Directors, each of which will guide a particular functional area. The SPD will be nominated by NOAA and approved by a Triagency Executive Committee (EXCOM); the Associate Directors will be nominated by the appropriate participating agency and approved by the SPD. The Under Secretary-level Executive Committee will act as the Board of Directors for the program. The EXCOM will also coordinate program plans, budgets, and policies and will ensure agency funding commitments are equitable and sustained. The three agencies are developing a process for identifying, validating, and documenting requirements for the converged system. Those requirements will define the system baseline used to develop agency budgets.

The Department of Commerce, through NOAA, will have lead agency responsibility to the Executive Committee for the converged system. NOAA will have lead agency responsibility to support the IPO for satellite operations. NOAA will also have the lead for interfacing with national and international civil user communities, consistent with national security and foreign policy requirements.

The Department of Defense will have lead agency responsibility to support the IPO in major systems acquisitions. NASA will have lead agency responsibility to support the IPO in facilitating the development and insertion of new cost-effective technologies to meet operational requirements.

The U.S. will seek to implement the converged system in a manner that encourages cooperation with foreign governments and international organizations consistent with U.S. requirements and national interests. This cooperation will be conducted in support of these requirements in coordination with the Department of State and other interested agencies.

The agencies are intent on converging the two U.S. operational polar meteorological satellite programs. The first major step toward this end is establishing the Integrated Program Office (IPO). The three agencies have established an Triagency Adhoc Convergence Transition Team (TACTT) to develop the plan to activate the IPO. As a first order of business, the agencies will select the individuals to fill their key IPO positions. The TACTT will at the minimum conduct those planning activities necessary to develop Memorandum of Agreements, locate and occupy a facility for the IPO and further define detailed management and programmatic procedures.

This approach reflects a change in previous interagency working groups because specialized programmatic and technical expertise of each agency will focus upon working together to meet the program's set of combined requirements, and less on the previous narrow specialized perspectives of each parent agency.

The Triagency Steering Committee has captured the spirit of reinventing government, as this group did not limit itself to reusing previous methods and approaches. Rather, the triagency convergence study group identified and analyzed previous lessons learned in search of innovative solutions that would offer the greatest probability of the program's success.

Mr. Chairman, this concludes my prepared statement. I will be glad to answer any questions.

The CHAIRMAN. Well, we appreciate your appearance. Where is that IPO? In what Department of Government is the Integrated Program Office?

Dr. WATSON. It will consist of members of DOD.

The CHAIRMAN. I know what it will consist of, but where is it when I want to find it? Is it in Commerce? NASA? Is it in the Department of Defense or over in the White House? How do I find it?

Dr. WATSON. In NOAA, Jim Baker.

The CHAIRMAN. All right. Dr. Baker, do you want to testify?

STATEMENT OF THE HONORABLE D. JAMES BAKER, UNDER SECRETARY OF COMMERCE FOR OCEANS AND ATMOSPHERE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION; ACCOMPANIED BY WILLIAM TOWNSEND, DEPUTY ASSOCIATE ADMINISTRATOR, MISSION TO PLANET EARTH, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Dr. BAKER. Thank you, Mr. Chairman, and let me thank you again for your help on the GOES satellite. It is still working very well and we are getting good imagery from it, as you know, and I appreciate your leadership and help in identifying the GOES issues and helping us solve those.

Mr. Chairman, as you know, on eight occasions since 1972 DOD and NOAA have studied convergence and have taken actions to increase coordination and avoid unnecessary duplication in their respective operational satellite programs. As a result, the Defense Meteorological Satellite Program—DMSP—and NOAA's Polar-Orbiting Environmental Satellite—POES—System use similar spacecraft hardware providing complementary environmental data for the Nation.

Now, for the first time in our history, both programs have plans to develop a new generation of satellites at the same time. These concurrent efforts provided a unique opportunity to explore full convergence of the two programs. We performed that study to determine overall cost to the Government, with the goal of preserving the operational capability of both the NOAA satellites and the Air Force satellites, to preserve the missions there. The results of that study led to the President's directive to establish the converged program, and we had a committee: George Schneiter who is here, Kathy Sullivan from NOAA, and Bill Townsend from NASA led that study and deserve the credit for pulling that together.

A key facet of the converged program is the Integrated Program Office that you just mentioned. This office will be responsible for the management, acquisition, and operation of the converged system. The integrated office will be under the direction of a system program director who will report to a Triagency Executive Committee at the Under Secretary level. The director will be nominated by NOAA and approved by the Executive Committee, with the responsibility of providing the overall direction of the converged program and its elements to achieve program objectives.

The executive committee will act as the board of directors for the program to provide policy guidance; to ensure sustained Agency support; and approve the management plan, budget, and acquisition strategy. NOAA will have lead-agency responsibility to the Executive Committee for the converged system. NOAA will also have lead agency responsibility to support the integrated office for system operations and for coordinating the national and international civil user communities.

The effects on future NOAA budgets of implementing the plan have not been defined in full detail. However, the agencies recognize the need to support the polar follow-on programs in the 1995 President's budget. Funds from the former DMSP block 6 and NOAA O, P, Q programs will be used to initiate detailed engineering tradeoff analyses to define the system concept. With respect to NOAA's budget, the converged program will allow savings from

converging the previously planned follow-on development programs in NOAA and DOD. Additional savings may be achieved by incorporating appropriate aspects of NASA's Earth Observing System Program. The greatest savings to be achieved through convergence will be realized after fiscal year 2000.

Given the importance of avoiding any delay in the design and development of the converged satellite system, an ad hoc triagency convergence transition team has already been established and headquartered in Silver Spring at NOAA. This team will conduct planning activities necessary to develop an interagency memorandum of agreement and further define detailed management and programmatic procedures.

Finally, Mr. Chairman, as you know, NOAA has been involved in discussions for several years already to have the European Meteorological Operational Mission polar satellite series, or METOP series, to replace NOAA's current morning satellite beginning with the launch of METOP–1 currently set for late in the year 2000. With budget authority from Congress we are in the process of procuring a set of NOAA operational environmental instruments to contribute to a joint polar system for flight on METOP–1. Recognizing the costsavings potential of the METOP partnership and the benefits accruing to the U.S. Government from international payload cooperation and data sharing, our working baseline analysis is that the U.S. converged constellation will include the European METOP satellite series.

On May 6, I spoke to John Morgan of EUMETSAT and extended an invitation to him to join us as partners in this new venture. I also spoke with Jean-Marie Luton of ESA and acknowledged their role in the METOP satellite series. They both congratulated us on our efforts thus far, and expressed a willingness to work with us to explore METOP participation in the converged system. In follow-up correspondence with both of them, I emphasized that cooperation with METOP and our EUMETSAT and ESA partners is critical to our efforts to enhance further development of an operational global observing system.

We are now engaged in investigating with our European partners whether U.S. mission requirements can be achieved in the inclusion of the METOP series in our converged system. We fully understand that it is too early for EUMETSAT to provide a considered response. In our view, reactions to our invitation for partnership have been positive in our preliminary discussions with EUMETSAT, and in initial responses to soundings taken with NATO and throughout EUROPE by the State Department.

We are working together with DOD and NASA to address a few questions that have been raised by EUMETSAT. Of our six mission requirements, we are particularly focusing on two. We know that our converged sensor suite will not be ready to fly on METOP–1 or –2. Data deniability needs to be further explored in upcoming discussions. Our initial assessment is that no significant problems exist for the other four requirements.

Following its biannual council meeting next week, EUMETSAT expects to send a team to Washington to continue discussions of convergence-related issues and discussion of an agreement for joint polar program cooperation on NOAA N and N-prime and on

METOP–1 and –2. This would be consistent with EUMETSAT's desire to finalize a text prior to seeking full METOP–1 and –2 budgetary approval at the November council meeting for EUMETSAT. We foresee a further session this summer in Darmstadt, with final review of the METOP–1 and –2 agreement in both the United States and among EUMETSAT delegate bodies to commence at the end of the summer to meet the November target date.

Mr. Chairman, this concludes my prepared statement. I will be happy to answer any questions.

[The prepared statement of Dr. Baker follows:]

PREPARED STATEMENT OF DR. D. JAMES BAKER

I appreciate this opportunity to appear before you to comment on the Administration's decision to converge the Department of Commerce (DOC) National Oceanic and Atmospheric Administration (NOAA) Polar-Orbiting Operational Environmental Satellite (POES) program and the Department of Defense (DOD) Defense Meteorological Satellite Program (DMSP). The National Aeronautics and Space Administration (NASA) will also provide new remote sensing and spacecraft technologies which could improve the operational capabilities of the converged system. Accompanying me today is Dr. Kathryn D. Sullivan, NOAA's Chief Scientist and Mr. Robert Winokur, Assistant Administrator for Satellite and Information Services. Also, joining me is Mr. William F. Townsend, Deputy Associate Administrator, Office of Mission to Planet Earth, NASA.

Polar satellites collect temperature and moisture measurements (key inputs to numerical weather prediction models generating all national and global three- to five-day weather forecasts); measurements of the Antarctic ozone levels, long-term environmental measurements supporting global climate change studies; sea surface temperature measurements; global cloud-cover images; and global snow cover analyses. NOAA's polar satellites also provide other valuable support missions, such as monitoring emergency distress beacons to aid search and rescue missions and worldwide data collection to support a variety of activities such as endangered species monitoring and monitoring of the Earth's space environment (its magnetic fields and particles).

On eight occasions since 1972, DOD and NOAA have studied convergence and taken actions to increase coordination and avoid unnecessary duplication in their respective operational satellite programs. As a result, the DMSP and POES programs use a similar spacecraft bus employing a number of common components and subsystems, use the same launch vehicle, divide ground product processing duties, provide complementary environmental data to the nation, and work together on research and development efforts. While years of close cooperation have produced many similarities in spacecraft hardware and basic meteorological observational missions, there are marked differences in each agency's specific applications and system requirements. The result is a combination of instruments with similar missions but distinctly different specifications and independent management and operations.

Now, for the first time in history, both programs have plans to develop a new generation of satellites at the same time. These concurrent efforts provided a unique opportunity to explore full convergence of the two programs. We performed that study to determine how to reduce overall costs to the government while preserving the operational capability of both the DOC and DOD missions. The study performed over the last year demonstrated to the participating agencies that a converged program could meet these goals. This led to President Clinton's signing the Presidential Decision Directive (PDD) directing DOC, DOD, and NASA to establish the converged program. Details of how the agencies will implement the converged program are documented in the plan sent to you in May.

A key facet of the plan is our integrated approach to manage the converged program. An Integrated Program Office (IPO) will be responsible for the management, acquisition, and operation of the converged system. The IPO will be under the direction of a System Program Director (SPD) who will report to a Triagency Executive Committee (EXCOM) at the Under Secretary-level. The EXCOM will act as the Board of Directors for the program to provide policy guidance; ensure sustained agency support; and approve the management plan, budget, acquisition strategy, operations concept, and baseline (e.g., cost, schedule and performance, etc.) requirements.

NOAA will have lead agency responsibilities to the EXCOM for the converged system. The SPD will be nominated by NOAA and approved by, the EXCOM. The SPD is responsible for providing the overall direction of the converged program and its elements, to achieve program objectives. This includes managing the financial, programmatic, and technical performance of the program, leading and directing all management functions (including the formal interface with any international partners), centrally controlling the distribution of all resources through the program, and giving final approval for all contract actions, to ensure effective overall program level system engineering, integration, and program control.

NOAA will also have lead agency responsibility to support the IPO for system operations including the ground stations for command and control of the satellites. It will be the responsibility of this function to ensure that data are supplied to the system's users and that the converged system is capable of required data retrieval, data handling and data distribution to users.

NOAA will have the lead for interfacing with national and international civil user communities. This will ensure the system has civilian interface for international contacts. These lead roles reflect NOAA's experience in the operations of the POES and Geostationary Operational Environmental Satellites (GOES) programs, and its role in important international satellite coordination groups, including the Committee on Earth Observation Satellites (CEOS) and the Coordination Group for Meteorological Satellites (CGMS). A converged system can accommodate international cooperation including open distribution of environmental data.

The effects on future NOAA budgets of implementing the plan have not yet been defined in full detail. However, the agencies recognize the need to support the polar follow-on programs in the President's fiscal year 1995 Budget. Funds from the former DMSP Block 6 and NOAA O, P, Q programs will be used to initiate detailed engineering trade-off analyses to define the system concept. With respect to NOAA's budget, the converged program will allow savings from converging the previously planned follow-on development programs in NOAA and DOD. Additional savings may be achieved by incorporating appropriate aspects of NASA's Earth Observing System Program. The greatest savings to be achieved through convergence will be realized after fiscal year 2000.

At the present time, a multi-agency approach to funding the converged system appears to be the most practical alternative. For the development of the fiscal year 1996 budget, the Departments of Commerce and Defense, and NASA, will provide convergence budget briefings to the Office of Management and Budget (OMB) and the Office of Science and Technology Policy.

The IPO budget request will be reflected in the individual budgets submitted to OMB by the agencies for fiscal year 1996. The IPO will be in place to support the fiscal year 1997 budget requests. Annually thereafter, the IPO will generate budget programming requirements which will be approved by the EXCOM and subsequently entered into each agency's budget formulation process. The Administration expects the involvement of the EXCOM members in the system requirements and funding approval process to ensure agencies support for the IPO generated budget requests. Improved estimates of costs and savings will be developed to support the President's fiscal year 1996 Budget and further refined as integrated program requirements are finalized and the instrument complement is defined.

The first step in developing procedures for ensuring that critical NOAA operational and fundamental requirements will be met in a converged system is establishment of an AD HOC Triagency Convergence Transition Team (TACTT). The TACTT has already been established, given the importance of avoiding any delay in initiating trade-off analyses leading to design and 'development, of the converged satellite system. This team will continue the technical definition of the converged system as well as pursue convergence plans and discussions with the Europeans. The TACTT will manage those planning activities necessary to develop a Memorandum of Agreement, to locate and occupy a facility for the IPO, and to further define detailed management and programmatic procedures.

We have also developed a process to incorporate operational requirements into a joint-agency requirements baseline. Two joint-agency groups will manage and control the operational requirements process: a Joint-Agency Requirements Group (JARG) and a Joint-Agency Requirements Council (JARC). They will develop an Integrated Operational Requirements Document (IORD) and submit it to the JARG for final approval. During the IORD approval process, cost considerations will be made through JARG interaction with the IPO. The IPO will address the program's ability to accommodate the proposed requirements within the system's allocated financial and technical resources.

The question of when to have the first converged satellite available is a function of how to make best use of the satellites of the current programs. The best approach

allows both agencies to fly out existing and programmed assets while immediately creating the IPO to develop and acquire the converged system. Given the projected life expectancies and the probable failure rate of the current satellites, the agencies estimate this need date to be 2004. Alternative approaches, which we studied, included modifying existing satellites. The triagency study concluded these alternative approaches cost more and contained greater risk compared to flying out existing assets.

This 2004 need date fits well with the time projected for a full acquisition cycle. Taking into account historical development and production timelines, we estimate it will take ten years to produce the first converged satellite. This allows an appropriate low risk development cycle, to work out problems associated with new developments, before going into production.

As members-of the Committee know, discussions have been underway for several years to have the European METOP (METeorological OPerational Mission) polar satellite series to replace NOAA's current morning satellite beginning with the launch of METOP-1, currently set for late in the year 2000. METOP is a joint undertaking of the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), the European Space Agency (ESA), and their member states. With congressional appropriations, we are in the process of procuring a set of NOAA operational environmental instruments to contribute to a Joint Polar System for flight on METOP-1. Recognizing the cost savings potential of the METOP partnership and the benefits accruing to the United States Government (USG) from international payload cooperation and data sharing, our working baseline is that the U.S. converged constellation will include the European METOP satellite series.

On May 6, I spoke to John Morgan of EUMETSAT and extended an invitation to join us as partners in this new venture. I also spoke with Jean-Marie Luton of ESA and recognized the role of ESA in the METOP satellite series. They both congratulated us on our efforts thus far and expressed a willingness to work with us to explore METOP participation in our converged system. In follow-up correspondence with both of them, I emphasized that cooperation with METOP is critical to our efforts to enhance further development of an operational global observing system.

We are now engaged in investigating with our European partners whether U.S. mission requirements can be achieved in the inclusion of the METOP series in our converged system. Our needs include:

- operation of the METOP satellite at the 0930 equator crossing time;
- inclusion of U.S.-provided sensors on METOP to meet U.S. core requirements;
- implementation of the U.S. data distribution policy for U.S. instruments on METOP. In accordance with the principle outlined in the President's Decision Directive on Convergence, there is also a requirement to selectively deny critical environmental data to an adversary during crisis or war yet ensure the use of such data by U.S. and Allied military forces. Such data will be made available to other users when it no longer has military utility;
- assurance of a common satellite replacement policy to ensure data continuity; and
- availability of Joint Polar System data for all USG agencies.

Robert Winokur, accompanied by DOD and NASA representatives, met with John Morgan at EUMETSAT Headquarters in Darmstadt, Germany, on May 19-20. He will pursue a similar mission to Paris early next leek. NOAA and NASA representatives accompanied DOD to a meeting in Brussels this past March to discuss the USG data denial mission requirement with the North Atlantic Treaty Organization Military Committee Meteorological Group. Together, the three agencies have worked with the Department of State which has charged posts abroad to brief government authorities on the invitation for European METOP satellite participation in the converged U.S. program.

We fully understand that it is too early for EUMETSAT to provide a considered response. In our view, reactions to our invitation for partnership have been positive in our preliminary discussions with EUMETSAT and in initial responses to the NATO and State Department soundings. We are working together with DOD and NASA to address a few questions raised by EUMETSAT. Of our six mission requirements for inclusion of the EUMETSAT spacecraft, we are particularly focussing on two. We know that our converged sensor suite will not be ready to fly on METOP-1 or -2. Data deniability needs to be further explored in upcoming discussions. Our initial assessment is that no significant problems exist regarding the other four requirements.

Following its biannual Council Meeting next week, EUMETSAT expects to send a team to Washington to continue discussions of convergence-related issues and to work toward an Agreement for Joint Polar Program cooperation on NOAA N and

N' and METOP-1 and -2, consistent with EUMETSAT's desire to finalize a text prior to seeking full METOP-1 and -2 budgetary approval at its November Council-meeting. We foresee an additional session this summer in Darmstadt with final review of the METOP-1 and -2 Agreement in both the United States and among EUMETSAT delegate bodies to commence at the end of the summer to meet the November target date.

Mr. Chairman, this concludes my prepared statement. I will be glad to answer any questions.

The CHAIRMAN. Very good. Dr. Schneiter.

STATEMENT OF DR. GEORGE R. SCHNEITER, DIRECTOR, STRATEGIC AND SPACE SYSTEMS, DEPARTMENT OF DEFENSE; ACCOMPANIED BY RICHARD McCORMICK, DEPUTY ASSISTANT SECRETARY OF THE AIR FORCE FOR SPACE PLANS AND POLICY

Dr. SCHNEITER. Thank you, Mr. Chairman. Like my colleagues, I appreciate the opportunity to discuss meteorological satellite convergence with you today. Accompanying me today is Richard McCormick, who is Deputy Assistant Secretary of the Air Force for Space Plans and Policy, who has had very heavy involvement in this activity as well.

The Department of Defense is pleased to be a partner with NOAA and NASA in this new era of interagency cooperation and interdependence. The decision to converge two operational satellite systems, one civil and one military, into a single national system, is a landmark and is extremely important to both the civilian and national security user communities.

The integrated management structure described by Dr. Baker builds on the inherent expertise of each agency, thus strengthening the converged program. We in the Department of Defense accept the responsibility of supporting the Integrated Program Office as lead agency for acquisition. In doing so, we will support the Integrated Program Office by providing the Associate Director for Acquisition, who will be responsible for acquiring and fielding the space, ground and command, control, and communications segments as well as be responsible for launch and early on-orbit checkout of U.S. Government spacecraft in the constellation.

The Department will also play a significant role in supporting the remainder of the converged system. We will provide the Principal Deputy System Program Director. DOD personnel and facilities will be integral to converged program operations. This will include the use of the Air Force satellite control network, which will also provide an austere mission backup command and control capability at Falcon Air Force Base. The operations concept for the converged program will take into account both the military and civil operational needs.

Both DOD and NOAA vitally need a successful Polar Orbiting Meteorological Satellite Program to satisfy national security and civil operational requirements. We are convinced the integrated approach for developing, acquiring, operating, and managing the converged program builds an interdependency among the agencies, thereby providing the underpinnings of success.

The Executive Committee, in its role as a board of directors, reinforces the interdependency of the agencies. As the Executive Committee provides policy guidance and approves the management

plan, budget, acquisition strategy, operations concept, and baselines, it will be placing agency stamps of approval on the program.

In creating the converged program, the agencies will take core national security requirements that must be satisfied during conflict or war and merge them with critical civil requirements to forge a single operational system. The Department of Defense has a longstanding requirement for assured, accurate, and timely access to environmental data critical to the operations of U.S. military forces.

We have in the past demonstrated our commitment to a sustainable meteorological satellite program. The evolution of the converged program represents neither a change in our fundamental requirement nor a change in our commitment to satisfying it.

We recognize the potential for further costsavings through a desirable partnership with the European Organization for the Exploitation of Meteorological Satellites, EUMETSAT, and we are working aggressively with NOAA, NASA, and their European partners, to determine if U.S. mission requirements for the inclusion of the EUMETSAT spacecraft as part of the converged system can be achieved.

Those requirements for the inclusion of the EUMETSAT spacecraft are designed to ensure availability of critical data when and where it is needed to support military operations and civil requirements. Significant among these requirements is the requirement for selective data denial. The United States recognizes the importance of meteorological data to military planning and the execution of military operations. We require the capability to selectively deny data to an adversary during crisis or war, yet ensure use of such data to United States and allied military forces. The decision to deny data would be made at the highest levels of the U.S. Government. Data would be denied only on a real time basis. The data will be archived and made available as soon as practical to support national and international research needs when those data no longer have military utility.

Like NOAA, the Department of Defense has not yet fully defined the effects of convergence on future budgets. We recognize there will be some up-front costs to establish the Integrated Program Office and to initiate concept trade studies. To meet these funding needs, we believe the budget requests for the follow-on programs as contained in the fiscal year 1995 President's budget must remain unchanged.

Further definition of program costs and savings will be developed to support the President's fiscal 1996 budget.

Mr. Chairman, this summarizes my main points. I will submit my prepared statement for the record and be glad to answer any questions.

[The prepared statement of Dr. Schneiter follows:]

PREPARED STATEMENT OF DR. GEORGE R. SCHNEITER

Like my colleagues, I appreciate the opportunity to appear before you to comment on convergence. Accompanying me today is Mr. Richard McCormick, Deputy Assistant Secretary of the Air Force for Space Plans and Policy. Thank you for recognizing Defense's interest in and commitment to the converged program by virtue of your invitation to join NOAA in testifying at this hearing. As you know, we have previously integrated some elements of the military and civil polar weather satellite

programs, but have not reached full convergence. Your interest in the success of the Tri-Agency convergence study was a factor in our success to this point; your continued support as we work to further define the programmatic and budgetary aspects of a converged national program will likewise be very important.

The Department of Defense is pleased to be a partner, with NOAA and NASA, in this new era of interagency cooperation and interdependence. The decision to converge two operational satellite systems—one civil and one military—into a single national system is a landmark one and is extremely important to both the civilian and national security user communities.

The integrated management structure described by Dr. Baker builds on the inherent expertise of each agency, thus strengthening the converged program. We in the Department of Defense accept the responsibility of supporting the Integrated Program Office (IPO) as lead agency for Acquisition.

In doing so, we will support the IPO by providing the Associate Director for Acquisition, who will be responsible for acquiring and fielding the space, ground, and command, control, and communications segments, as well as be responsible for launch and early on-orbit checkout of the U.S. government spacecraft in the constellation. System acquisition will be conducted under the statutory authorities of the Under Secretary of Defense for Acquisition and Technology. DoD acquisition procedures and infrastructure will be modified as appropriate, to reflect the triagency character of the converged program, and the program's Executive Committee will concur on all significant convergence related decisions. The Department of Defense is well equipped to conduct the acquisition necessary to meet the program cost, performance, and schedule objectives.

The Department will play a significant role in supporting the remainder of the converged program. We will provide the Principal Deputy System Program Director. DoD personnel and facilities will be integral to converged program operations. This will include the use of the Air Force Satellite Control Network, which will also provide an austere mission backup command and control capability at Falcon Air Force Base. The operations concept for the converged program will take into account both the military and civil operational needs.

Both DoD and NOAA vitally need a successful polar-orbiting meteorological satellite program to satisfy national security and civil operational requirements. We are convinced the integrated approach for developing, acquiring, operating and managing the converged program builds an interdependency among the agencies, thereby providing the underpinnings of success. The Executive Committee, in their role as a Board of Directors, reinforces the interdependency of the agencies. As the EXCOM provides policy guidance—and approves the management plan, budget, acquisition strategy, operations concept and baselines—they will be placing agency stamps of approval on the program.

In creating the converged program, the agencies will take core national security requirements that must be satisfied during conflict or war, and merge them with critical civil requirements to forge a single operational system. The Department of Defense has a long-standing requirement for assured, accurate, and timely access to environmental data critical to the operations of U.S military forces. We have in the past demonstrated our commitment to a sustainable meteorological satellite program as we fielded the Defense Meteorological Satellite Program. The evolution of the converged program represents neither a change in our fundamental requirement nor a change in our commitment to satisfying it.

Key to ensuring that the converged program satisfies critical civil and military operational requirements is the completion of the joint agency validated requirements document. The three agencies have agreed to use a requirements process patterned after that used by the Department of Defense. The joint agency requirements definition process is well underway. This process will ensure the baseline requirements for the converged program are as accountable and as responsive to operational user needs as are the baseline requirements for the current single agency programs.

The converged program provides the nation with the opportunity to accomplish its operational meteorological, oceanographic, and hydrologic remote sensing missions (both military and civil) in a more cost-effective manner, which will ultimately save money for the taxpayer, the government and each agency.

We recognize the potential for further cost savings through a desirable partnership with the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) and we are working aggressively with NOAA, NASA, and their European partners to determine if U.S. mission requirements for the inclusion of the EUMETSAT spacecraft, as part of the converged system, can be achieved. Those requirements for the inclusion of the EUMETSAT spacecraft were developed in con-

cert with NOAA and NASA and are designed to ensure availability of critical data when and where it is needed to support military operations and civil requirements.

Significant among these requirements is the requirement for selective data denial. The United States recognizes the importance of meteorological data to military planning and the execution of military operations. The United States requires the capability to selectively deny data to an adversary during crisis or war, yet ensure use of such data to United States and allied military forces. The decision to deny data would be made at the highest levels of the United States Government. Data would be denied only on a real-time basis. Data will be archived and made available as soon as practical to support national and international research needs when those data no longer have military utility.

If key United States Government requirements can be satisfied, we believe inclusion of the EUMETSAT spacecraft will not adversely impact military operations.

Like NOAA, the Department of Defense has not yet fully defined the effect of convergence on future budgets. We recognize there will be some up-front costs to establish the IPO and to initiate concept trade studies. To meet these funding needs, we believe the budget requests for the follow-on programs as contained in the FY95 President's 3udget must remain unchanged.

We will continue to work with NOAA and NASA to develop our joint funding needs for the FY96 budget and beyond, and to better define the 1994-through-1999 savings initially estimated in the National Performance Review. The converged program will certainly allow our combined projected budgets for our follow-on programs to be reduced in the long term, while still satisfying DoD mission requirements. Further definition of program costs and savings will be developed to support the President's FY 96 budget.

With the formal establishment of the IPO and Executive Committee by October 1, 1994, the mechanism will be in place to ensure each agency can sustain its budgetary commitment to the program. The involvement of the EXCOM members in the system requirements and funding approval processes will be integral to the success of the converged program.

We believe this convergence is a true example of how the agencies can reinvent their ability to satisfy critical requirements at reduced cost to the government and taxpayer. We look forward to working with our partners as we proceed down the path of convergence. We are confident that the integrated cooperative approach demonstrated successfully over the past ten months will continue as we move from studying convergence to actually implementing this important endeavor.

Mr. Chairman, this concludes my prepared statement. I will be glad to answer any questions.

The CHAIRMAN. Well, it is commendable, that you three gentlemen are working together, and there is no question that this spirit of cooperation is necessary for us to really save the money and get an effective program in a unified fashion for both the defense and civil needs. But I wonder if we cannot get it even more streamlined, or more integrated?

When you say the integrated approach for development, acquiring, operating, managing—the converged program builds interdependency among the agencies thereby providing the underpinnings of success, you could almost replace the word "success" with "failure." That is the congressional misgiving, because therein plants the seeds of oh, no, they were responsible, no, this one is responsible, the next one has faulted, and what-have-you.

Dr. Baker is supposed to be in charge now, but we have got so many cooks that even—I who support the program have a difficulty following it. In other words, you have got here the IPO would be under the direction of the System Program Director, who would report to a Tri-Agency Executive Committee at the Under Secretary level. You have done lost this Senator, you know what I mean? When you get that confused, it seems to me before I get into the budget things, which really have got to be ironed out, Dr. Watson, can't you and the office—are you not in the office with Dr. Gibbons?

Dr. WATSON. Yes.

The CHAIRMAN. Well, we used to work with him for years over in the Office of Technology Assessment, and I could see us meeting with him now, and we would be telling him to get this thing better organized. I know you have got a lot of input, but to fix the responsibility is my problem. I think you have got it over, as I understand it, in NOAA, but you do not have the money there. Do you have the money, Dr. Baker, for this program?

Dr. BAKER. Let me answer that question in two parts, Mr. Chairman. First of all, this program has a characteristic which I think can make it successful and which I think is one of the major drivers for it. That is that the data that is collected by the polar satellites is absolutely critical for both agencies, and I think when we have a situation like that we can put together an interagency program that can work.

Now, you are absolutely correct, there are many examples of failures here, but an outstanding example of success is the NEXRAD program, which in fact is an interagency program where NOAA has worked very closely with the Department of Defense and with the Federal Aviation Administration, and the agencies have actually helped each other out in times of need. There is an example I think where in both cases the data is absolutely critical and central to the mission of the agency, and that is what drives us to believe we can have a successful interagency program.

The CHAIRMAN. Well, the Europeans, do the Europeans think they can save some money? What is the inducement for the European cooperation?

Dr. BAKER. Well, we started the discussion with the Europeans several years ago because they have an interest in flying an operational polar orbiting satellite to be in conjunction with their geostationary satellite which they operate—in fact, which we have borrowed at various times.

They have a strong incentive to show that they can have a full complement of both research and operational satellites. They do not save money by flying a new operational system, but they show that in fact they are part of an international effort to provide a full suite of both operational and research satellites. We felt with their interest and our need from NOAA's side in having a close cooperation that we could go to that joint NOAA/European satellite, so that is an effort that has been in train for some time.

The CHAIRMAN. Well, I know it is an ongoing effort, but the signals have changed with respect to the military or security requirements. Is that not what really is holding up the Europeans actually coming and signing on to this particular program?

Dr. BAKER. Well, now that we have a converged system between our civilian and military side, we do have a military requirement for data deniability, which is a new aspect to the way in which we would handle data. As soon as we got agreement among ourselves about how we thought a system could work, we started discussions with the Europeans—first with NATO, and now we have just started the discussions with EUMETSAT. Our initial indications are that this is something that could be achieved.

Now, various concerns are being raised, but I think it is very important to realize this is the initial step in our discussions. We have had several months of discussions. We will continue these dis-

cussions. I personally talked to John Morgan, who is the head of EUMETSAT. He told me just 3 days ago that they do not know enough about our converged program to make a definitive statement, and they are very eager to try to come to an agreement, because they want to have an operational system. They want to work with us, we want to work with them.

The CHAIRMAN. What about the contractors? I understand the great savings is that Martin-Marietta, that the same facility produces the military and produces the civilian satellite at one and the same time, almost in the same building with a wall in between, and the only difference between the two completed systems is the transponders themselves. Is the contractor going along with this? Do they have some misgivings?

Dr. BAKER. I have not had any direct contact with that, but I should say the two systems are not identical. There has been some convergence on the bus, but we fly different instruments on the two different satellites. These satellites are about the same size, but a different shape, and they have different capabilities, so really it is not an identical system at this point.

But let me just ask Dr. Winokur if we have had any conversations with the contractor. [Pause.]

Dr. BAKER. No, we have not had any conversations with Martin-Marietta on that.

The CHAIRMAN. So, at this particular point, let us assume the hearing is completed here today. You do not expect anything of the committee other than our understanding and support—in other words, budgetarily or anything else of that kind? The budget would be the same for 1995. There is no change, and so there is nothing for this committee to do this year, or is there?

Dr. BAKER. Well, I would say that, Mr. Chairman, we look for more than understanding and support. We look for guidance. You have provided leadership on this effort in the past, and we will continue to come to you for that. We want to have an iterative process, but you are right in terms of the 1995 budget. We are not looking for additional funds at this point.

The CHAIRMAN. Thank you. Senator Exon.

OPENING STATEMENT OF SENATOR EXON

Senator EXON. Mr. Chairman, thank you very much. Gentlemen, thank you for being here, and I listened to your testimony, which is very important, and the questions asked by the chairman.

Let me follow up on some of those, if I can, with this statement. It seemed to me like this is a typical area where reinventing Government under the leadership of the Vice President is particularly important, and I think is bearing some fruit.

I would like to congratulate each one of you for the cooperative role your agencies have played in this area. I would like to ask this question: now that your three agencies are working together on this matter, where redundancy and overlapping at least have been an unnecessary expenditure in the view of this Senator, but in view of that and in working on this matter, have you been able to discover or discern, or have you talked about other areas of possible cooperation between your agencies?

Dr. BAKER. Yes. I can answer that. I think that George Schneiter will have a comment also.

I think we have been very pleased with the ability of our agencies to come together, particularly on these operational systems, which I think has been important, and Senator Exon, I wanted to thank you for your letter which initiated this process and gave us some very good guidance as we went into this. I think it was a very important step in the history of convergence.

We are looking at a number of dual-use technologies at the moment, and we have started discussion, for example, on how the Navy's underwater sound surveillance system might be operated in the future. These are systems and discussions which are very much in the preliminary stage, but the general idea of dual use technologies is very much on our mind.

But let me ask George Schneiter to comment on that.

Dr. SCHNEITER. We have not, Senator, in our activities here identified or sought to identify other particular areas. I think one thing that this process has done is brought together a group of people, who were previously not interacting, in a manner which may bear some fruit in that regard in the future, just due to discussions that we have in informal get- togethers, side meetings and such. But we have not explicitly dealt with any additional areas at this point.

Senator EXON. Well, I thank you for that. There is just this whole additional matter of GPS that I have been pushing for a long, long time. And I am very pleased to see that the military, whom I was fearful might not want to be as open and cooperative as they have been—I am very glad to see the military taking on what I think is a reasonable position on this.

I serve on the Armed Services Committee and I serve on this committee, and I want to congratulate all of you and your agencies for coming together for the common good, to eliminate some of the redundancy that I think we would all agree has been there in the past.

I would like to follow up on a question with a more pointed question with regard to the European cooperation. Do any of the participants have concerns about the cooperation—this initiative—and how it is going to be eventually received, or what is the situation generally today with the European cooperation and agreement? Under this joint cooperation, I would like to ask you this question, have you addressed, and who controls, the switch, so to speak, to turn off the data or turn on the data? Is there any risk that the United States would lose an advantage over an adversary as a result of this merger?

Dr. BAKER. Senator, let me answer that question first, and then the others can also chime in. We do have concerns, because each time a new party is brought to the table, that party brings interests and agendas that might not be identical to those of our own. We do believe, though, that the advantages of having the Europeans as part of this greatly outweigh the disadvantages. And that is why we have initiated the discussions.

As I said earlier, these are at a very preliminary stage. We have a firm idea of what it is that we require. And let me just indicate that we are looking for EUMETSAT to provide a satellite in the 9:30 orbit. We are looking to them to fly U.S.-provided instruments.

We are asking them to adopt and fund a launch on failure policy. We are looking to them to ensure data availability for all U.S. Government agencies. And we are looking for them to implement a real-time data denial capability on METOP, where we would control the switch.

I think it is a very clear point of view that we have. And we have laid that on the table.

At the moment, we have started the discussions from that point of view. But I think that we feel very strong about all of these.

George, do you have any further comment?

Senator EXON. Dr. Schneiter.

Dr. SCHNEITER. Many of these requirements resulted from concerns of the Department of Defense. And we are comfortable that if these requirements are met, then our needs will be met. And our forces will be supported, and appropriate data, as necessary, would be denied to our adversaries.

Senator EXON. Dr. Schneiter, as long as you are at the microphone, let me ask you this question. To what extent does DOD rely on commercial weather services, if at all? Are taxpayers paying a private sector source for data another branch of the Government provides for free?

Dr. SCHNEITER. We take advantage of data from the civil satellites and vice versa is true. We have done that in the past, and have made I think very efficient use of each other's data. The difference in what we are proposing to do now, as you well understand, is to do this with one system of satellites, thereby avoiding what in fact was, I suspect, some redundancies in capability.

Senator EXON. What arrangements, if any, do we have in that regard, Doctor, with regard to proprietary information with regard to national security? Let us suppose that we reach a time at some point in the future when the threat of international war or hostilities is quite imminent, are there ways and means under the system that is evolving that we could capture and prevent any and all other nations from obtaining certain pertinent data with regard to weather?

I think you grasp the thrust of the question that I am trying to get at. I do not know how well I have articulated it. I guess what I am saying is that cooperation is fine, but there may come a time when we wish we did not have that much cooperation. What about that?

Dr. SCHNEITER. Well, I think in the converged system, as we have defined it among the three agencies——

Senator EXON. In other words, you think that adequately covers it?

Dr. SCHNEITER. Yes, sir. I believe it does.

In our Defense Meteorological Satellite Program, for example, we encrypt the data. So that data is not available to our adversaries, obviously. We will have similar controls in the case of the converged system. Exactly what the details of those would be, we do not know at this time. But we are satisfied that the converged system, as we have mutually agreed and as it has been directed by the President, will satisfy our requirements.

Senator EXON. Do the other members of the panel have anything to add to that, or do you generally agree with the testimony that has just been given in this regard?

Dr. WATSON. Yes. In fact, it is very simply; it will have to be enforceable and it is a precondition of European involvement.

Senator EXON. Thank you.

My last question, Mr. Chairman, has to do with—I guess I would just ask the panel this question. I think the answer is yes, but I want to tie it down a little bit. The Department of Defense has in its current inventory polar orbiting satellite equipment, and you have addressed that to some extent in your statement. Does the current plan, in the opinion of the witnesses, make the most and best use of this existing equipment with regard to the polar orbiting satellites by DOD?

Dr. BAKER. Senator Exon, let me answer that. This was a question which you raised in your first letter to us. And it was one that we took very seriously in the studies that have gone on over the past months. We believe that we do have a proposal that provides minimum risk, that uses our satellites, and that provides the kind of overlap and time that we need to develop this new system.

We did look at other options. We looked at options of trading satellites, of using the parts from the DMSP satellites for the NOAA satellites, and a variety of other options. In the end, I think we all felt—and I think this is the unanimous view—that to start and have the first converged satellite available in the year 2004, with the first actual flight scheduled for 2006, makes a very nice timing for the fly out of the resources that DMSP has.

Remember they have four satellites in storage, five in production; NOAA has four in production and two in the early stages of production.

This allows us to fly out our existing assets, to take the time that is necessary to do the proper phase A and phase B studies for a converged set of instruments and satellite bus, and to have a system that provides proper overlap at the time of convergence so that we can do this right. I think we have all learned that things have to be done in their own time and in the right way to do it. And this allows us to fly out the assets we have and still have the time to do the proper planning.

If I may turn to the others and ask them how they feel.

Dr. SCHNEITER. I agree with what Dr. Baker has said. We will continue to examine this question. One thing we have underway now is the process of determining what are our mutual combined set of requirements. And we have a process going on that is coming up with those requirements.

We will then, when we have determined those requirements, examine the details of the actual convergence process, and see whether it makes sense to do anything different than what our first look indicated was the best way to do this. But our first look was that as described by Dr. Baker.

Senator EXON. Gentlemen, thank you very much.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you.

Senator Stevens.

Senator STEVENS. Thank you, Mr. Chairman. I apologize for my voice, and I hope you all can hear me.

I come at this some three ways and my colleagues come at it from different ways—intelligence, defense appropriations, and here. It does seem to me that this is a change that is mandated by changed world circumstances. But I have got some questions that I hope you can answer.

First, it does seem to me, if I understand this—from my staff briefing and what you have presented in your statements this morning—the cost of this program in the future will be NOAA and DOD split on a 50–50 basis; is that right?

Dr. BAKER. Yes; that is correct.

Senator STEVENS. NASA will be developing the new technologies, but the costs will be shifted to the DOD; right? Currently, part of that cost is financed in the NASA budget?

Mr. TOWNSEND. Yes, the role of NASA in this is potentially to apply technologies to the converged system that are currently being developed in the EOS program and are currently funded in the EOS budget as part of the NASA budget.

Senator STEVENS. But in the future the budget will be 50 percent NOAA and 50 percent DOD; am I wrong?

Dr. BAKER. That is correct, Senator. Let me say that that is strictly for the operations of the system. In other words, the NOAA/DOD split is for the cost of the operational satellite system, not for NASA R&D.

Senator STEVENS. That is correct, but NASA has some operating money now; right?

Mr. TOWNSEND. Well, not for the converged system. We have operating money for the EOS program. That will continue for the foreseeable future according to the current plan.

Senator STEVENS. Well, I would like some breakdown of that projection for the record, if you will. Because it does seem to me that this has the potential of shifting another civilian expenditure to the defense budget, and thereby reduce the amount of moneys that are available for national defense in the long run.

Mr. TOWNSEND. If I might, a couple of things. The role that we play here, I believe—the main role that we play here—is in bringing these new technologies onto the table for consideration on the part of the converged system for future use. For example, we are developing what we refer to as a common spacecraft bus in the EOS program, which has potential application to the converged system. And that is something that will certainly be looked at over the next 2 to 3 years as we work to define what the converged system is going to be.

Additionally, there are instruments that are being developed to fly, as Dr. Watson indicated, in our EOS–PM, our afternoon series of platforms, which do make meteorological-type observations as well as providing important science data relative to understanding global climate change.

Senator STEVENS. I understand that. I have just so much time here and I have some other questions that I would like to ask. But the real problem I have, which I want all of you to keep in mind, is we are going to watch very carefully that this is not a shift of DOD appropriations into a civilian agency.

And, Dr. Schneiter, you have had funds in the past to develop new technologies for satellite; have you not?

Dr. SCHNEITER. That is correct.

Senator STEVENS. You will not have them in the future; right? They will be in NASA's hands?

Dr. SCHNEITER. That is not at all clear. Let me say, Senator, we have not yet worked out the details of the funding split among the agencies. That is one thing that will be dealt with more in our working with OMB and in our developing the memorandum of agreement among the agencies.

I think Dr. Baker indicated we are talking roughly 50–50 here. It may not be exactly 50–50. We still have more work to do in that regard.

Senator STEVENS. Well, I want you to know I applaud the concept that we are going to have a sharing of these facilities and these capabilities. And certainly the availability of long-term weather forecasts, Dr. Baker, and the ability, really, to have the kind of data that comes from this convergence, particularly when you tie them together with the locator beacons, is going to mean a great deal to aviators in the Pacific and to the large fishing community in the Pacific.

I think that there is no question that that is going to enhance the NOAA program. In the back of my mind, however, is the fear that someone has got to switch. And I could have a fleet of fishing vessels out in the Pacific, and we could have some trouble with one of the Pacific nations and we decide that we are going to encrypt the data that fishing vessels have to have to operate. Now, tell me about this switch concept, Dr. Schneiter. Let me go to you.

As I understand it, there will be control somewhere to protect the integrity of defense systems. I am sure we would all applaud that. There is no problem about that. But where does it intersect the civilian community in terms of availability of data—for long-term data and for search and rescue type of data—the kind of things that a fishing fleet would want to be sure would be there without regard to other international problems?

Dr. SCHNEITER. Well, the sort of problem that you indicate is something that we would indeed have to deal with. What we might do in times of conflict or crisis is take steps to deny data in a certain area. That area will contain, in addition to adversaries, potentially friendly forces, friendly civil agencies. These are all factors that would have to be taken into account in making a decision.

I do not think it is possible to say a priori exactly what the rules would be with regard to that. Some judgment is going to have to be involved, and that will be done.

Senator STEVENS. Would it not be correct to say that today the redundancy that DOD and NASA and NOAA has gives us the ability to protect our defense operations and at the same time have available the kind of weather operations NOAA has required and also have a very vibrant and ongoing NASA program?

We are going to combine those now. They are going to converge; right? And there is going to be a point at which the convergence is going to hurt somebody, because the redundancy will not be there. Am I wrong?

Dr. BAKER. Senator, you are absolutely right. When we go to a converged system, we will have fewer U.S. satellites in orbit. We will have the same coverage by satellites that we planned to have. If we did not have convergence, we were going to have three U.S. satellites plus instruments on a European satellite. And we will now have a total of three satellites with instruments on a European satellite. But in the previous case, the United States would have flown one of those satellites, and now that is being replaced by a European satellite.

So, the total coverage by satellites that will fly in the converged system is the same that we would have had had we not done convergence.

And let me say one other thing to address your concern about the fisheries and search and rescue, which I think is an absolutely critical point. The technology allows us to place data denial on single instruments. So, it might very well be possible, although this has not been discussed and worked out at the moment, to deny data from one instrument and yet not deny data, for example, from search and rescue. That is certainly a possibility.

Senator STEVENS. You mentioned European participation; where is the Asian participation? If you want to look at it, 6 out of the 10 wide-body aircraft go across the Pacific. The bulk of our trade now is across the Pacific. Our largest fishing fleet is in the Pacific. Our largest number of participants in the tourist trade, whether people realize it or not, are now in the Pacific. Why is there not some Asian participation in this satellite program?

Dr. BAKER. Well, let me answer that question, Senator Stevens. It is a very important question, and we spend a lot of time talking to the Japanese and to the Chinese about the satellite interest that they have.

Senator STEVENS. The Russians, too?

Dr. BAKER. And the Russians.

The Japanese have a satellite program which today is a research and development program. They have not yet moved to the point of having an operational polar meteorological satellite. However, they may well move in that direction. They have strong interest in our flying more and more capable polar satellites every few years. They have approached us, and they said the converged system looks very interesting; is there a way for us to be a player?

I think, from our point of view, we are trying to take it one step at a time. First, we have NOAA cooperating with the DOD and NASA. Then we have NOAA cooperating in this converged system. We have cooperation with the Europeans. And I think as the Japanese show interest and want to move, we would do that. But there is an important point here. And that is that the data from the Japanese research and development satellites—their advanced Earth observation satellites—is in fact shared and made available. And one of the things that we do in NOAA and NASA—and I am sure the DOD has access to this data—this data is available for our researchers and our operational programs to use. And we have receiving stations to receive that data.

So, we are in full contact and, as I say, I was approached by the Japanese just recently to say we would like, at the appropriate point, to talk about how we might be part of this total system.

Dr. WATSON. Yes, I think that is the key point. There is a very close collaboration between us and the Japanese at the research level. The next logical step is the operational level. And that is where we obviously need some discussions with the Japanese and other countries in the future.

Senator STEVENS. Well, I have a great interest in the defense side as you know, but the real question to me is whether we should not have approached this from the point of view of having a worldwide civilian agency that dealt with the needs of the civilian community throughout the world, and we maintained our defense capability to go beyond that to meet our defense needs, which are unique in the world.

I do not think that we have got world participation in this concept. It looks like, once again, we are going to go it alone and we are going to continue to provide weather data for most of the world at our expense. We do not do the same thing in defense—thank God—I hope we do not start that, too.

But I do think that we may have missed the boat. Why did we not have some sort of a COMSAT for weather and a COMSAT, in effect, get out there and deal with this thing on a worldwide basis to start with? From what Dr. Watson says, we are going to tend toward that. We want the Japanese to come onboard later. Maybe the Chinese will come onboard later. Maybe the Russians will come onboard later. But why do they not come onboard now?

Dr. BAKER. Senator Stevens, let me give you at least a partial answer. I do not have a good, complete answer to your question, which I think is a very good one. We do have good international cooperation with the geostationary satellites. There are five such satellites, and they are coordinated to an international committee, and the data is shared. It actually works pretty well. There are a few glitches with the Indian satellite, but, on the whole, that is a system that works pretty well.

Now, following your advice, in fact, several years ago, NOAA started discussions with EUMETSAT because we wanted to have a system that was not just the United States providing worldwide data. And EUMETSAT was the first of any space agency to have an operational weather capability—that is, to desire to have an operational weather capability—which would be available in the year 2000.

So, several years ago, we started the discussions, where we would have an operation whereby they would fly a satellite and we would provide the instruments. So, that was a first step in the direction that you are talking about.

Now, to the extent that the Japanese or the Russians have an operational system that is comparable to what we have—that is, they have developed that capability—we are very open to trying to work with them. And we are taking the steps, as we are now working with EUMETSAT, to do that. And we are working very closely with the Japanese as they develop their systems.

But I think the important point is that at present they are behind us in terms of developing operational meteorological satellite programs. And as each country or EUMETSAT has developed this capability, we have tried to stay very close with them and to make the kind of arrangements that you are proposing.

Senator STEVENS. Well, I hope that that succeeds.

Mr. Chairman, I have taken a lot of time.

We have agreements now with Russia on search and rescue in the North Pacific area. But we do not have interoperable agreements for sharing of data of this kind yet on both sides. I assume we are doing most of that. But the one problem I have that crosses my mind—and the very last thing, then I come back to Mr. Townsend—the cutting edge of technology, I think even into the DOD area, has come from the research base of NASA. And as I look at this triad out there, you are sort of disappearing.

Mr. TOWNSEND. No, I do not believe that is true at all, sir. We, I think, have the potential to play a significant role here in terms of providing coverage, in terms of the budget, for the development of some key aspects of the converged system in the form of a spacecraft bus and potentially in the form of some new high-technology instruments that have the potential to provide vastly improved data and, therefore, vastly improved weather forecasts.

I think that is what NASA really brings to the table. And I think that we will work very closely—we have already—with our colleagues in DOD and NOAA to see that those capabilities are taken advantage of.

Senator STEVENS. Thank you very much, Mr. Chairman. I appreciate the fact that this is an open hearing. We hear to much of this in the classified sessions, and we are getting out some of this information, I think, so people can know what is happening.

I am not convinced yet that we need to abandon the total redundancy we have had in the past in the national interest. And I hope that we go very slow about losing the edge we have got from the military point of view and from the point of view of the development of new technology in NASA and in Dr. Baker's area. Obviously, we are the beneficiaries. Dr. Baker, I understand part of this will even be operated out of my State.

Let me ask one last question that I almost forgot. We are trying to keep up with this atomic waste that has been dumped in Russia. And someone told me the other day that with this new color system, we may be able to develop a way to detect nuclear waste in the oceans and track it through these systems. Is that true?

Dr. BAKER. I do not have a specific paper on that. But if it has a surface signature—in other words, if there is a surface effect, it is very likely that we can track it by satellite. Let me just check.

Senator STEVENS. I am told that there is a surface effect. But, unfortunately, the heavy stuff goes one way because of the deep currents and the lighter stuff would come across the top in terms of the wind-driven surface effect.

Dr. BAKER. Senator Stevens, I am very glad you asked that question, because I have never come to a hearing that you have been at that you have not taught me something new. We will check on this for you.

Senator STEVENS. I hope you will help us keep track of that.

Dr. BAKER. We will do that.

[The information referred to follows:]

Pollutants dumped directly into the ocean can be seen in the visible and infrared spectra. The Landsat 4, launched in 1982, Thematic Mapper (TM) has this capability as well as the NOAA Advanced Very High Resolution Radiometer (AVHRR) and

the Defense Meteorological Satellite Program (DMSP) Operational Line Scanner (OLA) under certain conditions. The polar-orbiting TIROS satellites began to gather data on sea surface temperatures using the AVHRR and microwave sensor in 1978. The TM delivers shorter visible ranges are for mapping coastal water color, differentiating between soil and vegetation, and measuring the reflectance and absorption of chlorophyll. Longer wavelength bands are used to determine vegetation moisture and the evaporation of water from plants, as well as for geological applications, such as the identification of rocks.

The "new color system" or Ocean Color and Temperature Scanner (OCTS) is planned for the Advanced Earth Observation Satellite (ADEOS), the next generation of Japanese Earth observation satellites, to continue and further advance Earth observation. Japan plans a February 1996 launch of ADEOS. The OCTS instrument measure global ocean color and sea surface temperature simultaneously during the day.

The Orbital Sciences Corporation is constructing the SeaStar satellites, which will carry the Sea-viewing Wide Field of view Sensor (SeaWIFS) to be flown later this year under a data purchase arrangement with NASA. SeaWIFS observes radiation in eight bands in the visible spectrum and will be used to observe chlorophyll, dissolved organic matter and pigment concentrations in the ocean. The sensor will contribute to understanding the health of the ocean and concentration of life forms in the ocean. Data will have significant commercial potential for fishing, ship routing, and aquaculture, and will be important for understanding the effects of changing ocean content and temperatures on the health of aquatic plants and animals.

It is important to note the limitations of all these instruments. The pollutants can only be tracked while they remain at or near the surface. Instruments in the visible and infrared spectrum do not penetrate the ocean very well. The resolution requires plumes [of pollutants] greater than 1 kilometer in coastal regions and greater than 4 kilometers in midocean areas. If nuclear wastes are sufficiently active to affect ocean productivity, long-term biological changes could be caused. These changes could possible produce changes in the oceans which could be detected with one or more of the above sensors.

In a preliminary report to Congress the Department of Defense released results of an intensive program that was started in 1993, continued into 1994, on "Nuclear Pollution in the Arctic Seas." The early results of radioactivity measurements in the vicinity of the FSU dumping of radioactivity, as well as nuclear testing, show that very localized regions do show an influence of such activities. However, "supercomputer ocean circulation modeling of the dispersion of the dumped material, assuming not containment and full solubility, suggests that the levels of radiation near Alaska from dumped materials would not significantly exceed background."

Senator STEVENS. If that waste that they dumped over there in those rivers of the Soviet Union before Russia really took over, if that ever finds its way into the North Pacific, the most prolific area for fisheries and for marine creatures will be just literally at stake. I think we must monitor that. And if there is any way to add something to this as you go along that will detect the spread of nuclear waste in particular, I would hope you would try.

Thank you very much, Mr. Chairman.

The CHAIRMAN. Very good.

Senator Lott.

Senator LOTT. No questions, Mr. Chairman.

The CHAIRMAN. You can see the praise that the committee has for this combined effort. And yet, at the same time, I am trying to get the budget fixed for various reasons. The Senator from Alaska is concerned perhaps that we just take away from DOD and put it into the civilian side. I am concerned that, Dr. Baker, that since the beginning, we have been trying to get the "o" back into the oceans. Your entire budget is $2 billion, and right now you are calling for a contract of two more satellites at $614 million, and you take on this additional assignment.

When I sit down and look at the NOAA budget, and you cut $140-some million out of it, where do we get the money? That is

a big concern. We understand that the Government is paralyzed at the present time. And while the individuals and the rhetoric are merged and everybody is working together, the numbers do not work together at all.

We have been trying for years, just a little while ago, to get some more Customs agents to enforce the dumping. So, on the House side, they have got it, but it looks like on the Senate side they did not put enough in there for crime so they are going to knock out the Customs agents there to get more money for crime.

It is a struggle, and the main thing you have left out—you say you have not worked out the details, as if they are just sort of refining. It is not refining, it is finding. It is finding the money.

Dr. Baker, what is your comment? Where are we going to get all of this money to get into your agency right now, which is getting more and more into satellites and less and less into oceans?

Dr. BAKER. Senator Hollings, this is a very important point for us. If we left the impression that this was a detail, we did not mean to do that. It is a very important point. It is an important driver for the program, because we do believe there are significant savings.

We know that there will be savings because we will have common planning. We will have common instrument development. We will have a reduction of the number of U.S. satellites. And we will have combined ground operations so that we will save money there.

So, we will do that, plus we will have planning just for one system. Right now we have planning in DOD and we have planning in NOAA for the system beyond the time of convergence. That is block 6 and in the O, P, Q, system. So, there will be savings. And the savings will begin to accrue in fiscal year 1996.

Now, how those savings get allocated, I think, is a very serious question. If they ended up all being allocated in DOD, then of course NOAA would not see that. And this is a serious issue for us, which is very much on the table as we look at how we work the budget issues.

Bob, do you want to comment on the budget and how the White House sees that?

Dr. WATSON. We believe that obviously a single converged system will result in total savings for the Government. The question of how it is allocated I think we need to look at. It is quite clear that appropriations for Commerce do not want to pay for DOD requirements and vice versa. People on DOD appropriations do not want to pay for Department of Commerce.

I believe that we can work together, through OMB and the three agencies—NASA, NOAA, and DOD—to find a way that is totally equitable. And one of the ideas is to make effectively the cost of the program proportional to the requirements.

Now, the reason Jim Baker said that there would be approximately a 50–50 split between DOD and NOAA for the operational phase of the program is we believe, to a first approximation, the requirements will be quite comparable. That is to say, probably 80 percent of the requirements for this converged system will be common to NOAA and to DOD. Therefore, those parts of the costs should be shared equitably.

If there are special requirements for NOAA or special requirements for DOD, they presumably will pay those additional costs for those rather specific requirements. But to a first approximation, we believe that a most likely costsharing will be requirements driven. And at the end of the day, if we are to have civilian and military meteorological needs met, this is the only way to move forward. But the end message is simply there should be a total savings to the Government and both DOD and NOAA should basically benefit from this.

The CHAIRMAN. And the baseline for those savings, Dr. Watson, can you give the committee the baseline use and how you factored out the savings? I agree there ought to be—I mean, I have got satellites coming out of my ears. I have got two DOD satellites—you can correct this—polar satellites. I have got two NOAA polar satellites. I have got two NOAA GOES satellites.

I have proposed one DOD polar, one NOAA polar, one European polar. I have proposed two NOAA ones—that is the ones that cost $614 million. And then, of course, over in NASA, with the EOS, the first to be launched in 1998, I have got three there.

So, I have got 14 or 15 satellites, not counting the intelligence satellites. We have got Dr. Woolsey over there, and he is a satellite man, too. I have got satellites everywhere.

In all candor now, when the Iraq thing broke out, we asked our man in Bagdad—we do not have a man in Bagdad—and we were going into Somalia—let me get briefed by—we do not have a man in Somalia. When we got this event here in Bosnia-Hercegovina, the former Yugoslavia—we do not have a man in Bosnia.

These are the misgivings that you learn from experience that you better buy a New York Times and find out what the devil is going on, because we have got all of these satellites. And I can quote General Schwartzkopf. He said the analysis of all this satellite information coming through the CIA, the corners were cut, the edges were rounded, so that when he got it, it was mush, m-u-s-h. That is the word he used. He said, "I had to depend on my pilots as to when to go forward."

So, we are not opposing. And we are going along with Vice President Gore, and let us try to combine these things and save some money. But next time we have a hearing and come before the committee, let us work out those details on the budget. Because that is what we all are fighting over here. It is like tying two cats by the tails and throwing them over the clotheslines here in this Congress. We are just all clawing each other. And I have to find out how I am going to come out on the top of the claw for NOAA right now.

Because we are trying to reinstitute the "o" in oceans and get back into that which has been neglected over the years. And just when we thought we were going in that direction it looks like we are going in the satellite direction. So, let us find out where the money is. Because if try to refurbish the fleet, they cut the money. If we try to furnish the fisheries programs, they cut the money.

We are closing down weather stations over the country; they cut the money. But now we have got this, and I am afraid to say, yes, the plan is a sound one, but NOAA will have to find the money. That is the kind of message we are getting out of the OMB office.

We appreciate your appearance here today. Give us the baseline and the inventory of satellites so we will all know how many we have got and where they are and who is paying for them, so just an ordinary Senator like myself can look at it and project out the cost and how it is going to operate. Those details you say have yet to be worked out. That is what we want to see.

[The information referred to follows:]

NEAR TERM CONVERGENCE BUDGET

As part of the DOC, DOD, and NASA convergence study accomplished over the last year, the agencies performed a rough costing exercise to determine the magnitude of expected costs for a converged system. While these numbers were of sufficient quality to determine the magnitude of expected costs for a converged system, they were inadequate to use as a funding baseline. Refined budget estimates will not be available until after the agencies approve joint requirements, followed by a conceptual study (tentatively scheduled for 1995) to determine options and costs to meet those requirements. The agencies have developed a preliminary budget profile for FY94–99 that should adequately support the early phases of the program.

Preliminary converged budget: Fiscal year 1994, $6 million; fiscal year 1995, $18 million; fiscal year 1996, $78 million; fiscal year 1997, $120 million; fiscal year 1998, $187 million; fiscal year 199, $340 million; total, $749 million.

BASIS FOR EXPECTED SAVINGS

The greatest benefit resulting from the rough cost study was agency confidence in identifying the sources of potential cost savings through convergence. The primary near term savings result from combining independent spacecraft development efforts into the single converged effort. For example, the independent efforts would have each cost around $300 million for the satellite hardware. The result would h ave been two satellites at the cost of $600 million. The converged spacecraft development should run around $350 million with the second costing about $100 million. This produces a savings of $150 million compared to the independent efforts.

In addition to the spacecraft development savings, a number of other areas are expected to provide real cost savings to the government. These areas include combined sensor developments, single government program office overseeing next generation system development effort, reduction in operational facilities/costs, and (in the long term) reduced n umber of satellites on-orbit. However, satellite complexity, ground segment modification costs to accept converged data stream, and communication slines to distribute higher amounts of data could result in increased costs. To mitigate these costs, conceptual studies will be performed to minimize these costs while satisfying customer requirements.

EXPECTED SAVINGS—NEAR TERM

Total program savings cannot be translated into annual program savings because no long term defined baseline exists. However, given that both agencies define projected program costs over 5 years, the agencies developed a near-term baseline and projected savings for that time period. Since most attention has been given to the savings identified in the National Performance Review (NPR), we are using that baseline here. The NPR near therm savings were projected on the FY94 President's Budget. Following are the original NOAA and DOD follow-on budget profiles as presented in the FY94 President's Budget compared with the preliminary converged system profile for FY94–99.

[Dollars in millions]

	Fiscal year 1994	Fiscal year 1995	Fiscal year 1996	Fiscal year 1997	Fiscal year 1998	Fiscal year 1999	Total
DOD FY94 PB	5	24	53	70	148	163	463
NOAA FY94 PB	1	49	116	126	120	120	532
Total FY94 PB	6	73	169	196	268	283	995
Converged budget	6	18	78	120	187	340	749
Baseline savings	.....	55	91	76	81	(57)	246

The CHAIRMAN. Thank you very, very much.
The committee will be in recess subject to the call of the Chair.
[Whereupon, at 11:30 a.m., the hearing was adjourned.]

○

BOSTON PUBLIC LIBRARY
3 9999 05982 264 1

ISBN 0-16-045966-4

90000

9 780160 459665